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Hard diffractive scattering from soft color screening effects

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We present a simple QCD-based model where the soft gluon rescattering between final state partons in deep inelastic scattering leads to events with large rapidity gaps and a leading proton. In the framework of this model the amplitude of the soft gluon exchanges is calculated in the eikonal approximation to all orders in perturbation theory. Both large and small invariant mass M_X limits are considered. The model successfully describes the precise HERA data on the diffractive deep inelastic cross section in the whole available kinematical range and give new insights on the density of gluons at very small momentum fractions in the proton.

Authors: Prof. INGELMAN, Gunnar (Uppsala University); Dr ENBERG, Rikard (Uppsala University); Dr PASECHNIK, Roman (Uppsala University)

Presenter: Dr PASECHNIK, Roman (Uppsala University)

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